

Research on the Integration of Innovation Elements into the Digital Transformation of Higher Vocational Specialty under the Background of Digital Economy

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Abstract: Innovation is a key word in the digital economy era. In recent years, innovation elements have become an important content of innovation theory research. Professional digital transformation is an innovative development activity of higher vocational colleges, which will inevitably integrate innovative elements and play its role. The digital transformation of specialty also reflects the requirement that specialty ADAPTS to the integrated development of industry. On the macro level, this paper explores the necessity and feasibility of digital transformation from the top-level design and group logic of professional groups. On the micro level, it studies the effective ways of professional digital transformation from the aspects of the revision of professional talent training scheme, curriculum system reform, teaching mode innovation, teacher team construction and so on.

Keywords: Digital economy, Innovation elements, Vocational specialty, Digital transformation.

1. Introduction

Over the past decade and more, China's digital economy has maintained a fast growth rate, and this trend has continued during the 13th Five-Year Plan period. The output of digital economy increased from 22.6 trillion yuan in 2016 to 39.2 trillion yuan in 2020, accounting for 30.3% of GDP to 38.6%, and the growth rate was significantly higher than the nominal GDP growth rate of about 8.5 percentage points in the same period [1]. Digital economy is divided into digital industrialization and industrial digitalization. The growth rate of output value of digital industrialization is obviously slower than that of industrial digitalization during the 13th Five-Year Plan period. From 2014 to 2019, the proportion of industry digitalization in the digital economy has increased from 73.9 percent to 80.2 percent. Industrial digital transformation and upgrading requires enterprises to continuously digital transformation. [2] Higher vocational colleges undertake the important task of training technical talents for enterprises. In the face of great reform and development, they must take appropriate talent training measures and explore the path of integrating innovative elements into professional construction by starting with professional digital transformation.

2. Literature Review on Innovation Elements

In the era of digital economy, innovation drives digital transformation and intelligence leads high-quality development. Scientific and technological innovation has become the driving force for optimizing industrial structure and transforming economic development mode. According to the practical requirements of digital transformation in higher vocational colleges, the connotation of innovation elements is divided into two parts, that is, the innovation input elements directly acting on digital transformation and the innovation environment elements serving innovation activities. In the context of digital economy, innovation input elements mainly include talent innovation elements, technological innovation elements and data innovation elements, and innovation

environment elements refer to institutional environment innovation elements [3]. From the perspective of innovation ecosystem theory, Dong Kaijun (2018) proposed that the essential characteristics of innovation system should be "self-regulation mechanism based on environment", and there are diversified dynamic structures according to time and space differences. Innovation ecosystem represents a shift from focusing on the composition of elements in the system to the dynamic connection between elements and the system and the environment, from the interaction within the innovation system to the interaction between the system and the external environment [4]. Xiao-cong li (2015) based on synergetics theory to construct the comprehensive coordination degree model of innovation system to calculate each subsystem degree of order, then the system total synergy degree of [5], and to put forward the internal innovation remains to be further improve the management level, to actively promote the overall innovation strategy, organization, technology and management, so as to promote innovation factors, the comprehensive coordination degree is further improved. Jing-ming chi, Ren Qi (2016) based on industrial economics in hz fender - Hector seaman index of the three major regional and provincial level of spatial agglomeration of university innovation elements resources measure, constructing innovative elements measure the spatial agglomeration degree of mathematical model, aims to explore optimization innovation elements of colleges and universities in the development of regional innovation way of rational allocation of [6]. Gao Qing (2021) deeply studied the impact of innovation function, regional innovation platform and innovation policy on scientific and technological innovation in universities from the perspective of university-industry cooperation, aiming to provide theoretical basis for improving the efficiency of scientific and technological innovation in universities [7].

In view of the existing literature, there are still deficiencies in the research on the synergy and integration of innovation elements in the professional digital transformation of higher vocational colleges. In view of this, this paper will focus on the following three aspects: first, the influencing factors and

mechanism of the integration of innovation elements in the professional digital transformation; Second, the necessity of digital transformation of higher vocational specialty into innovative elements; The third is the effective path of integrating innovative elements into professional digital transformation.

3. Influencing Factors and Mechanism of Professional Digital Transformation Integrating Innovation Elements

3.1. Functional Factors of Innovation

As an important part of national innovation system, higher vocational colleges undertake a series of innovation functions. From the perspective of basic function, the innovation function of higher vocational colleges can be divided into talent training, technology research and development and social service. Therefore, this paper focuses on the basic function perspective to analyze the impact of innovation function on the professional digital transformation of higher vocational colleges. First, talent cultivation is the core. Practice has proved that higher vocational colleges provide important talent support for the current regional economic development. The digitalization reform of specialty under the new specialty catalog requires higher vocational colleges to enhance the digitalization level of specialty construction, reform the cultivation mode of talents, and emphasize the creative ability and innovative thinking of talents. Secondly, technological research and development is the foundation. Professional digital transformation is inseparable from the integration of technology research and development elements in professional curriculum reform, so that research and development feedback teaching. Through the integration of "science and education", the teaching content is combined with cutting-edge science and technology to increase the knowledge stock and promote the transformation of innovative tacit knowledge to explicit knowledge from the breadth and depth of knowledge. Finally, social services are key. The ultimate goal of talent training and technology research and development in higher vocational colleges is to serve the society, especially enterprises. The fundamental purpose of professional digital transformation is to solve the problem that the professional development of higher vocational colleges is not synchronized with the regional industrial transformation and upgrading. Therefore, from the perspective of the integration of industry and education, the close connection between professional construction and digital economic development can promote higher vocational colleges to provide social services for regional development at multiple levels and through multiple channels, so as to improve the contribution rate of higher vocational colleges to industrial transformation and upgrading.

3.2. Factors of Innovation Platform

In this paper, "innovation platform" refers to the integrated system of innovation resource allocation formed by universities, scientific research institutions and enterprises and other innovation subjects under the joint action of government guidance and coordination mechanism, and each party undertakes different division of labor and responsibilities in knowledge creation and technological innovation. Research shows that innovation platform can

enhance the relationship embedding level of innovation subjects in innovation network, stimulate the power of knowledge diffusion, and thus promote the integration of resources [7]. The digital transformation of higher vocational colleges is not a task that can be undertaken by the school alone. It is necessary to realize the deep integration of resources of all parties through close interaction with all parties in the collaborative innovation network. It is the basic driving force of professional digital transformation to meet the technological needs of enterprises. Only by strengthening the synergistic mechanism of regional innovation platform can the innovation platform effect be generated and the goal of professional digital transformation be realized.

3.3. Innovation Policy Factors

There are certain uncertainties in the innovation activities of colleges and universities, so it is necessary for the government and other competent departments to manage and regulate them from the macro perspective, so as to reduce or transfer the risks and obstacles of innovation. Different types of policy tools have different impacts on innovation, which can be divided into supply policy, environment policy and demand policy. Supply-oriented policies mainly include capital investment, infrastructure construction, public service and talent training [8], aiming to promote the further development of industry-university-research collaborative innovation. Environment-oriented policy means that the government provides a good policy environment for innovation subjects through financial support, tax incentives, laws and regulations and other policies to ensure the smooth operation of the whole process from technology r&d to technology transfer [9]. Demand-type policy is mainly manifested as the driving force of policy to university innovation. The government continues to stimulate and create new demands through various measures, thus promoting the industrialization of innovative achievements [10]. In other words, in the process of industry-university-research collaborative innovation, policy incentives can help improve the knowledge transfer capacity of universities and absorptive capacity of enterprises, so as to improve the performance of industry-university-research collaborative innovation. Therefore, as one of the innovative activities, digital professional transformation in higher vocational colleges can only be carried out effectively under the guidance and guarantee of innovation policies.

3.4. Correlation of Influencing Factors

From the above analysis, it can be seen that innovation function, innovation platform and innovation policy are the key factors affecting the innovation development of colleges and universities. Researchers believe that these three factors do not exist independently, but mutually promote and depend on each other. First of all, innovation policy provides good material basis and institutional guarantee for the formation of innovation platform and drives the flow and integration of innovation resources and elements in innovation platform. Secondly, innovation policy can also lay a solid foundation for the cultivation of talents' innovation ability and the transformation of technology research and development. Thirdly, according to the law of university development, innovation policy promotes the modernization of university governance capacity by increasing the input of human, financial and material, so as to give full play to the basic innovation functions of university talent training, technology

research and development and social service.

4. The Inevitable Requirements of the Digital Transformation of Higher Vocational Specialty into Innovative Elements

There is no cross-border integration among higher vocational majors to effectively promote the digital transformation of majors.

Although professional group construction has been carried out in higher vocational colleges, there is a lack of cross-border integration and penetration conducive to professional digital transformation within and among non-professional groups, which makes the professional "group" of colleges separate from the needs of industrial development. The cultivated talents cannot adapt to the professional requirements of "de-division of work process, de-stratification of talent structure, high-end skill operation, research of work mode and integration of service in production" [11]. First, the construction of professional groups still lacks the top-level design of value logic. Failed to construct the logic of talent training from the construction and management level of professional group, failed to effectively clarify the relationship between professional group and professional. Second, the cross-border degree of talent training is insufficient. There are many problems in the construction of professional groups, such as "group but not integration" and "appearance and alienation", which lead to some limitations in cross-border talent training. Third, the composite degree of talent training technology is insufficient. Although many schools offer technical courses such as RPA and Python, there are still problems of unclear main lines and insufficient integration of technology and business scenarios in technical enabling courses. Fourth, the course content and actual business integration degree is insufficient. There is still a lack of integration between core courses, extended courses and business scenes, which affects the cultivation of practical business operation ability.

The training goal of higher vocational professional talents is inconsistent with the job demand of digital transformation of enterprises.

According to the information released by the Ministry of Human Resources and Social Security and other departments, most new jobs in society are closely related to the digital economy, and digital ability will also become one of the necessary skills of labor force [12]. It is speculated that in the era of digital-intelligence economy, professionals need to be trained to know indicator calculation and data analysis, and to be able to use big data analysis methods and tools to make decisions and suggestions in business activities. Understand data management and visual presentation, can let "data speak", have the ability to build data structure and analysis framework; Understand the industry development, proficient in enterprise business, can use professional design/optimization of enterprise management system and business process; Familiar with process analysis, data processing, data analysis tools and techniques, able to use tools to complete analysis and report, create value for the enterprise. At present, the professional digital transformation of the existing higher vocational colleges has not realized the effective combination of professional skills and digital technology, which cannot meet the upgrading requirements of industrial digital

transformation and the job demand of enterprise digital transformation for the time being.

The teaching content of higher vocational professional courses obviously lags behind the development of new technology and technology.

First of all, the textbooks used in higher vocational courses are relatively outdated and of low quality. There are a series of problems in the textbooks, such as disconnection with the digital economy era, slow update of information, and difficulty of some contents out of the actual situation of vocational college students. However, the new technology, new technology and new business mode that students are interested in are rarely involved in the textbooks. In addition, there are limited high-level high-quality textbooks available for higher vocational colleges, most teachers take self-compiled lectures as the main materials of course teaching, and the feedback system of textbook use has not yet been formed, so it is difficult to control the quality of textbooks. Secondly, the big data expansion module in the professional curriculum system has not been formed, and the fresh "blood" such as data analysis, data mining and information system operation has not been injected into the curriculum. There are no new practical training courses in the digital economy era, such as data collection, sorting, analysis and so on, which are most needed to be mastered at present and in the future [13]. Thirdly, the classroom teaching method adopted by teachers is too traditional and single, which seriously affects students' interest in course learning. Students are tired of teaching method, discussion method, case analysis method and other teaching methods. They are more eager to practice in enterprises and participate in targeted practical teaching activities to train professional thinking and improve practical ability.

It is difficult for the professional teachers in higher vocational colleges to meet the teaching requirements of digital transformation

Most higher vocational colleges divide specialized basic courses and specialized core courses in detail. For example, accounting teachers only undertake the teaching of basic accounting, financial accounting, cost accounting, management accounting, industrial accounting and other courses, while tax law, accounting computerization and other courses are taught by other professional teachers. Although, professional teachers in higher vocational colleges generally has the qualification of "double division", but has the qualification of "double" of teachers, not necessarily represent complex professional teachers' skills, most of the professional teachers in higher vocational colleges is not professional work experience, the lack of the whole process, systematic business operation experience, don't know about post the latest capacity requirements. Therefore, when majors and courses enter the stage of digital transformation, they are often unable to adapt to the new teaching requirements, and the direction and content of reform are not clear and clear, leading to the rejection of reform.

5. Effective Path of Integrating Innovative Elements into Digital Transformation of Higher Vocational Specialty

5.1. To Improve the Integration of Industry, Science and Education, Make the Professional Group "Digital"

Specialty construction can better than professional group of construction to adapt to the objective requirement of the development of the industry amalgamation, because along with the Internet, data fusion, artificial intelligence and the depth of the real economy, the industry also showed a trend of multiple formats fusion development, therefore, higher vocational colleges has to be "digital" professional group of training compound talents to meet the needs of new jobs. At present, there are many advantages in constructing professional groups based on industrial chain. For example, the service field of professional groups is relatively clear, and the professional chain connects with the industrial chain, so as to better improve the development ability of professional service industry. In the process of digital transformation of professional groups, through the deep integration of schools, governments, industries and enterprises, centering on the two main lines of talent training and scientific and technological innovation, innovative technology and skills highland is created to give full play to the effect of integrated development of industry, science and education.

5.2. Integrate New Digital Content to Make the Course "Digital"

Professional teachers of higher vocational colleges should research company on a regular basis, timely understanding of professional digital reality demand, business enterprise with new forms, new model, new technology, new positions on the ability of technical skills talents demand, according to the education teaching rule and rule of talent growth refactoring curriculum system, renew the content of the courses, courses in digital technology, digital professional courses, And the digital ability training and professional education organic integration. At the same time, enterprises need to participate the talent training plan formulation, the digital construction of the curriculum system and teaching resources, to build as the main line, between common perfect high-level talents training course system, digital through digital curriculum system construction, solve the problem of high-level personnel training fault.

5.3. To Create a New Teaching Model and Make Teaching "Digital"

Professional digital transformation requires teachers to develop and build a new teaching mode based on "Internet +" in classroom teaching, plan teaching content and design and develop digital skills training projects according to professional talent training programs. Select knowledge points and skill points that are difficult for students to understand, not intuitive, not vivid and difficult for teachers to demonstrate, and use digital resources such as video, animation, simulation and virtual reality for skill operation to realize man-machine interactive operation and intelligent assessment and evaluation. In addition, the school creates a digital learning atmosphere and provides a digital

environment for teachers and students to teach and learn by building smart classrooms and digital intelligence training bases and other teaching places [14].

5.4. Deepen the New Mechanism of Introducing and Training at the Same Time, and Make Professional Teachers "Digital"

Formulate the construction plan of introducing and cultivating digital teaching staff, improve the policy of talent introduction, attract talents from computer, network technology, intelligent manufacturing and other professional fields to the teaching staff, and form a teaching team with diversified ability structure. Internal training of teachers, enterprise teacher certification, teaching ability improvement training and other methods are adopted to improve team digital education and teaching ability. Give full play to the function of the teacher development center, provide all-round training for teachers' professional ability, teaching ability and scientific research ability, and conduct regular assessment, inspection and evaluation. In all kinds of training, especially should improve "the double teacher" teachers' professional skills training, enhancing university-enterprise cooperation and technical exchanges, and constantly update and learning a line production of new technology, new technology, including technical skills training, curriculum development, technology and application, artificial intelligence, intelligent snatched, big data technologies, such as content, help teachers to apply digital technology in the education teaching reform.

6. Conclusion

This paper starts with the influencing factors and mechanism of the integration of professional digitalization transformation into innovation elements, deeply analyzes the correlation between innovation function factors, innovation platform factors and innovation policy factors and professional digitalization transformation, and proposes solutions to the problems encountered in the process of professional digitalization transformation. At present, the professional digital transformation of higher vocational colleges is still in the preliminary exploration stage, and the number of majors implementing the transformation is still relatively limited, resulting in relatively few related researches. Therefore, more digital transformation practices are needed to provide the basis for theoretical innovation.

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